

Report from the Airplane Performance Harmonization Working Group

Issue: Steep Approach Operations

1 - What is underlying safety issue to be addressed by the FAR/JAR? [Explain the underlying safety rationale for the requirement. Why should the requirement exist? What prompted this rulemaking activity (e.g., new technology, service history, etc.)?]

For the purpose of dispatching an aircraft to a destination airport, the FAR requires that the aircraft can be brought to a full stop within 60% of the available runway length, assuming a 50 ft threshold crossing height. The JAR requires an operator to obtain special approval to use an approach angle greater than or equal to 4.5 degrees, and optionally base the landing field length limited weight on a threshold crossing height less than 50 ft, but not less than 35 feet.

The JAR provides this relief in order to accommodate some of the existing commuter aircraft operations in Northern Europe. These operations onto extremely short airfields with steep approaches would not be possible without the relief provided by the JAR.

2 - What are the current FAR and JAR standards relative to this subject? [Reproduce the FAR and JAR rules text as indicated below.]

Current FAR text:

Part 121

§ 121.195 Airplanes: Turbine engine powered: Landing limitations: Destination airports.

(b) Except as provided in paragraph (c), (d), or (e) of this section, no person operating a turbine engine powered airplane may take off that airplane unless its weight on arrival, allowing for normal consumption of fuel and oil in flight (in accordance with the landing distance set forth in the Airplane Flight Manual for the elevation of the destination airport and the wind conditions anticipated there at the time of landing), would allow a full stop landing at the intended destination airport within 60 percent of the effective length of each runway described below from a point 50 feet above the intersection of the obstruction clearance plane and the runway.

§ 121.197 Airplanes: Turbine engine powered: Landing limitations: Alternate airports.

No person may list an airport as an alternate airport in a dispatch or flight release for a turbine engine powered airplane unless (based on the assumptions in § 121.195 (b)) that airplane at the weight anticipated at the time of arrival can be brought to a full stop landing within 70 percent of the effective length of the runway for turbopropeller powered airplanes and 60 percent of the effective length of the runway for turbojet

powered airplanes, from a point 50 feet above the intersection of the obstruction clearance plane and the runway. In the case of an alternate airport for departure, as provided in § 121.617, allowance may be made for fuel jettisoning in addition to normal consumption of fuel and oil when determining the weight anticipated at the time of arrival.

Part 135

§ 135.385 Airplanes: Large transport category airplanes: Turbine engine powered: Landing limitations: Destination airports.

(b) Except as provided in paragraph (c), (d), or (e) of this section, no person operating a turbine engine powered large transport category airplane may take off that airplane unless its weight on arrival, allowing for normal consumption of fuel and oil in flight (in accordance with the landing distance set forth in the Airplane Flight Manual for the elevation of the destination airport and the wind conditions anticipated there at the time of landing), would allow a full stop landing at the intended destination airport within 60 percent of the effective length of each runway described below from a point 50 feet above the intersection of the obstruction clearance plane and the runway.

§ 135.387 Airplanes: Large transport category airplanes: Turbine engine powered: Landing limitations: Alternate airports.

No person may select an airport as an alternate airport for a turbine engine powered large transport category airplane unless (based on the assumptions in § 135.385 (b)) that airplane, at the weight anticipated at the time of arrival, can be brought to a full stop landing within 70 percent of the effective length of the runway for turbopropeller-powered airplanes and 60 percent of the effective length of the runway for turbojet powered airplanes, from a point 50 feet above the intersection of the obstruction clearance plane and the runway.

Current JAR text:

JAR-OPS 1.515 Landing – Dry Runways (See AMC OPS 1.510 and 1.515)

- (a) An operator shall ensure that the landing mass of the aeroplane determined in accordance with JAR-OPS 1.475(a) for the estimated time of landing at the destination aerodrome and at any alternate aerodrome allows a full stop landing from 50 ft above the threshold:
 - (1) For turbo-jet powered aeroplanes, within 60% of the landing distance available; or
 - (2) For turbo-propeller powered aeroplanes, within 70% of the landing distance available.

- (3) For Steep Approach procedures the Authority may approve the use of landing distance data factored in accordance with subparagraphs (a)(1) and (a)(2) above as appropriate, based on a screen height of less than 50 ft, but not less than 35 ft. (See Appendix 1 to JAR-OPS 1.515(a)(3).).

Appendix 1 to JAR-OPS 1.515(a)(3) Steep Approach Procedures

- (a) The Authority may approve the application of Steep Approach procedures using glideslope angles of 4.5° or more and with screen heights of less than 50 ft but not less than 35 ft, provided that the following criteria are met:
 - (1) The Aeroplane Flight Manual must state the maximum approved glideslope angle, any other limitations, normal, abnormal or emergency procedures for the steep approach as well as amendments to the field length data when using steep approach criteria;
 - (2) A suitable glidepath reference system comprising at least a visual glidepath indicating system must be available at each aerodrome at which steep approach procedures are to be conducted; and
 - (3) Weather minima must be specified and approved for each runway to be used with a steep approach. Consideration must be given to the following:
 - (i) The obstacle situation;
 - (ii) The type of glidepath reference and runway guidance such as visual aids, MLS, 3D-NAV, ILS, LLZ, VOR, NDB;
 - (iii) The minimum visual reference to the required at DH and MDA;
 - (iv) Available airborne equipment;
 - (v) Pilot qualification and special aerodrome familiarisation;
 - (vi) Aeroplane Flight Manual limitations and procedures; and
 - (vii) Missed approach criteria.

2a – If no FAR or JAR standard exists, what means have been used to ensure this safety issue is addressed? [Reproduce text from issue papers, special conditions, policy, certification action items, etc., that have been used relative to this issue]

N/A

3 - What are the differences in the FAA and JAA standards or policy and what do these differences result in? [Explain the differences in the standards or policy, and what these differences result in relative to (as applicable) design features/capability, safety margins, cost, stringency, etc.]

Currently, the Part 121/135 operating rules do not specifically address landing field length performance for a steep approach. Unless otherwise authorized by the Administrator in accordance with § 121.173(f), the performance calculation must be based on a 50 ft threshold crossing height. In contrast to the FAA requirements, the JAR does specifically require operators obtain approval for approach angles greater than 4.5 degrees. In addition, the operator may take a landing distance credit for using a threshold crossing height that is less than 50 ft, but not less than 35 ft.

The landing distance credit allowed by the JAR would result in a higher field length limit weight for the JAR operator. However, it is recognized that a FAR operator would never be operating the same aircraft into the same airport as the JAR operator, and therefore there is no competitive economic advantage for a JAR operator (or economic disadvantage for an FAA operator).

4 - What, if any, are the differences in the current means of compliance? [Provide a brief explanation of any differences in the current compliance criteria or methodology (e.g., issue papers), including any differences in either criteria, methodology, or application that result in a difference in stringency between the standards.]

N/A – The FAR does not contain a standard for determining field length landing performance based on a steep approach, so there is no applicable means of compliance.

5 – What is the proposed action? [Describe the new proposed requirement, or the proposed change to the existing requirement, as applicable. Is the proposed action to introduce a new standard, or to take some other action? Explain what action is being proposed (not the regulatory text, but the underlying rationale) and why that direction was chosen for each proposed action.]

The proposed action is to not harmonize to the JAR standard. This requirement was added to the JAR regulation to address approach angles which are steeper than those which are considered by the certification requirements, in recognition of the limited number of steep approaches that were being encountered by European operators. These are mainly a very limited number of commuter aircraft operations occurring in the Northern European countries. Within the US, an operator could request an exemption in order to achieve the lower landing criteria, however, unlike the JAR, there is no requirement that the landing distance credit be contained within the AFM. While the JAR is not necessarily limited to short runways or commuter aircraft, the main beneficiaries of this rule are commuter operations onto extremely short runways with higher than normal approach angles. Therefore there is no competitive benefit to be lost or gained by adopting this rule into the FAR.